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(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

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(54) Fire Alarm

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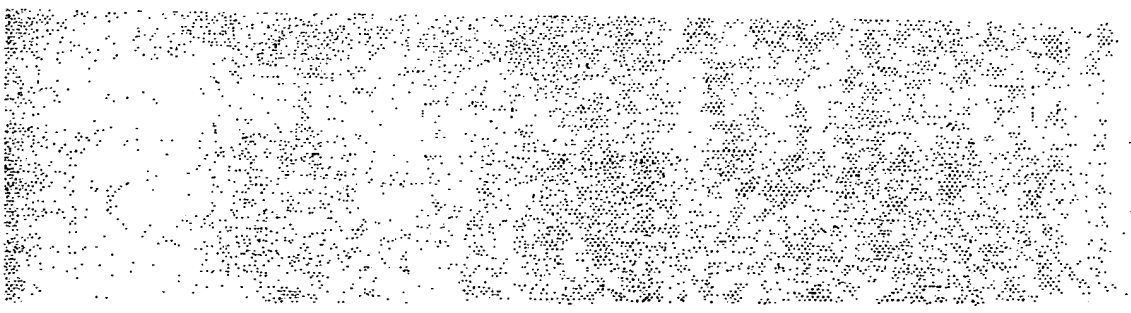
Abstract

A fire alarm that includes an alarm insert and a mounting and in which, in the inserted condition, the alarm insert fully masks the mounting. The alarm insert has a movable closure device, preferably a ring, by which the alarm insert is mechanically arrested relative to the mounting. Marking elements are provided on the alarm insert which marking elements permit the correct final position of the alarm insert, in relation to the mounting, to be checked.



Fire Alarm

This invention relates to improvements to a fire alarm.

Fire alarms are generally known which are employed to protect human life and material assets in fire-alarm installations for the early detection of fires. Such fire alarm installations generally comprise a signal control station and fire alarms distributed in the premises to be protected.

The fire alarms include fire-specific sensors, electronic amplifiers and devices for the transmission of information to the signal control station. In terms of construction, a fire alarm as a rule comprises the actual fire alarm (alarm insert), which includes the sensors and the electronic system, and an alarm base (mounting), which is fixedly mounted in the room to be monitored and into which the alarm insert is inserted. In this way it is possible to remove the alarm inserts for checking and to reinsert them.

Having regard to the stringent requirements which are imposed upon the reliability of fire alarm systems, it is urgently necessary to eliminate weak points in such systems as far as possible. Such a weak point is undoubtedly the alarm insert/mounting connection, since the functional capability of the entire

fire alarm system is to a high degree dependent thereon. Accordingly, it is understandable that the manufacturers of such systems are endeavouring to guarantee the reliability of the alarm insert/mounting connection by good constructional solutions.

The following requirements are, inter alia, imposed upon the alarm insert/mounting connection:

- reliable electrical contact
- protection of the contacts against contamination and corrosion
- reliable mechanical securing
- good external design (appearance)

The last requirement is raised in particular on account of the fact that the alarms are frequently installed at locations where the aesthetics of the design play a part. This includes theatres, museums and historical buildings.

In order to combine a design of an attractive shape with a good protection against contamination of the contacts, it was proposed inter alia in the German utility model DE-U1-92'10'856, to design the alarm insert so that in the inserted condition it fully masks the mounting. This additionally has the further advantage that colour changes of the mounting due to ageing do not have a disadvantageous effect on the appearance of the

alarm, when, for example after a certain length of time, the alarm insert is replaced.

It is necessary to consider as a disadvantage of such a construction the circumstance that with all alarms in which the alarm insert fully masks the alarm mounting, it is difficult to recognise whether the insert is sitting correctly in the mounting. However, this is an indispensable prerequisite for all fire alarms which comprise a mounting and an insert. Incorrectly inserted alarm inserts are a priori sources of error and disturbance and nowadays frequently give rise to complaints.

Sufficient account of this problem has clearly not been taken in the past. A monitoring of the correct position of the alarm insert following completion of insertion by trained specialist personnel was only later found to be essential. The increased expenditure associated with this must be tolerated in the interests of the functional capability of the entire system, even though this leads to an increase in the installation costs.

An object of the present invention is to overcome the disadvantages of the fire alarms of the prior art and especially to provide a fire alarm of the type mentioned at the outset, which alarm exhibits a

closure device which is fitted to the alarm insert and which both effects the mechanical arresting of the alarm insert and permits a clear recognition of the correct final position of the alarm insert, even from a distance of a few metres. As a result of this, the monitoring is substantially facilitated and the associated expenditure is reduced to a minimum.

This object is achieved in a fire alarm comprising an alarm insert and a mounting, into which the alarm insert can be inserted and in which, in the inserted condition, the alarm insert fully masks the mounting, characterized in that the alarm insert has a lower part and a closure device movably mounted thereon and by which the alarm insert is mechanically arrested in relation to the mounting, said movable closure device including a first marking element which, in the final position of the alarm insert, is brought into a definite position in relation to a second marking element on said lower part of the alarm insert whereby the correct final position of the alarm insert in relation to the mounting is recognisable from outside.

The invention is illustrated by way of example in the accompanying drawings wherein:

Figure 1 is a side elevation of a fire alarm according to the present invention with a closure device

in the open condition;

Figure 2 is a cross-section along line A-A of Figure 1;

Figure 3 is a side elevation of the fire alarm according to Figure 1 with the closure device closed; and

Figure 4 is a cross-section along line B-B of Figure 3.

Figure 1 shows a fire alarm having a mounting 1 and an alarm insert 2, which includes a movable ring 3 and a lower part 4. The ring 3 is freely movable within a specified angular range relative to the lower part 4 of the alarm insert 2. The means rotatably mounting ring 3 on lower part 4 are a simple web or collar projecting from one of the elements and being in engagement with a groove on the other. The alarm insert 2 is locked to the mounting 1 by a closure device. A first marking element 5 is disposed at the outer surface of the ring 3 and a second marking element 6 is disposed at the outer surface of the lower part 4 of the alarm insert 2 so that in the open, unlocked condition of the fire alarm the first marking element 5 is clearly displaced from the second marking element 6 by a specified angle.

The locking device comprises three guide cams 7 and an arresting cam 8, which are disposed at the inner surface of the ring 3. Further, the mounting 1 exhibits

three guide detents 9 associated with the guide cams 7 as well as a retaining cam 10 associated with the arresting cam 8. In order to lock the alarm insert 2 to the mounting via the closure device, the alarm insert 2 is in the first instance brought into a joining position with respect to the mounting 1, which position is shown in Figure 2. To this end, the three guide cams 7 are inserted into the guide detents 9 associated with them. The closure device is actuated in that the ring 3 is rotated through a specified angle and the guide cams move along the guide detents. The locking is completed in that the arresting cam 8 is brought past the retaining cam 10. In this position, as shown in Figures 3 and 4, the first marking element 5 and the second marking element 6 lie in a straight line. A complete and correct locking is readily visible, by means of these marking elements, from a distance of several metres.

In an actual installation the base is mounted on the ceiling of a room and the insert 2 is clamped in a rod-like tool. The operator aligns the tool to the base, presses the insert 2 to the base and rotates the tool whereby the insert is screwed into the base. At the end of this screwing operation the insert 2 is joined to the base 1 but not locked to it. This position is shown in Figures 1 and 2: The arresting cam 8 is located (with

reference to the direction of rotation) in front of the retaining cam 10 and marking elements 5 and 6 do not lie in a straight line but are displaced from each other. Now, to complete the locking, the ring 3 is rotated further (with reference to Figure 2 in a counterclockwise direction) until the arresting cam 8 snaps over the retaining cam 10. In this position with the arresting cam 8 being engaged at the back of the retaining cam 10, the marking elements 5 and 6 lie in a straight line as shown in Figure 3.

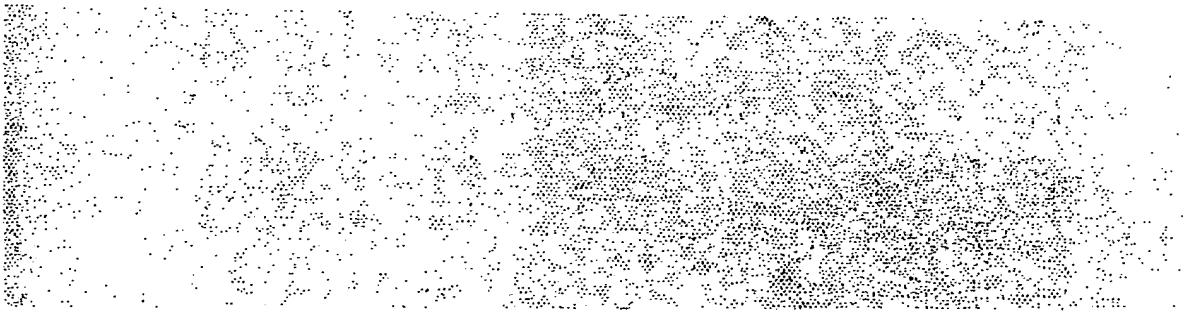
Modifications of the above-described fire alarm construction are possible within the limits of the invention according to the claims and are familiar to a person skilled in the art.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A fire alarm comprising an alarm insert and a mounting, into which the alarm insert can be inserted and in which, in the inserted condition, the alarm insert fully masks the mounting, characterized in that the alarm insert has a lower part and a closure device movably mounted thereon and by which the alarm insert is mechanically arrested in relation to the mounting, said movable closure device including a first marking element which, in the final position of the alarm insert, is brought into a definite position in relation to a second marking element on said lower part of the alarm insert, whereby the correct final position of the alarm insert in relation to the mounting is recognisable from outside.

2. A fire alarm according to Claim 1, characterized in that the closure device comprises a ring mounted in an upper end of the alarm insert.

3. A fire alarm according to Claim 1, characterized in that the marking elements comprise shaped elements, which are disposed adjacent one another for the purpose of the recognition of the final position of the alarm insert.



4. A fire alarm according to Claims 1, 2 or 3, characterized in that said marking elements are ribs on the outer surface of the alarm insert.

5. A fire alarm according to Claims 1, 2 or 3, characterized in that the marking elements differ in colour from the alarm insert.

6. A fire alarm according to Claim 1, characterized in that said closure device includes means which are disposed and constructed so that they can actuate an electrical contact which generates a signal when the final position of the alarm insert is reached.

7. A fire alarm according to Claim 6, characterized in that further means are provided which are arranged so that the signal is transmitted to the control station.

8. A fire alarm according to Claims 6, or 7, characterized in that further means are provided which are arranged so that an optical signal is generated by the electrical contact at the alarm insert.

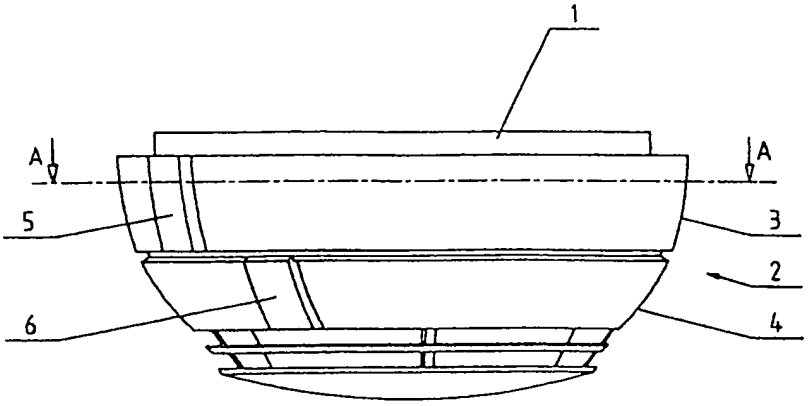


Fig. 1

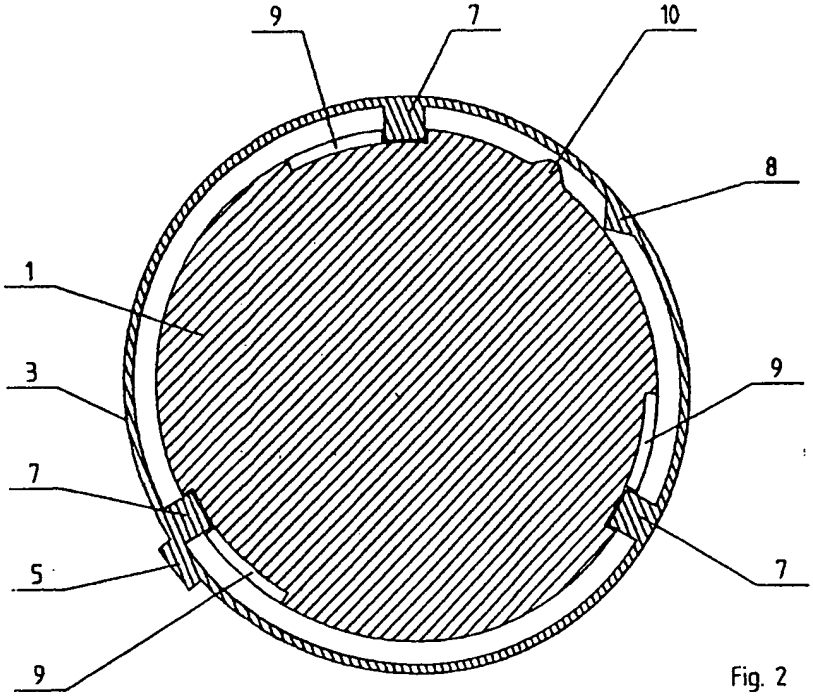


Fig. 2

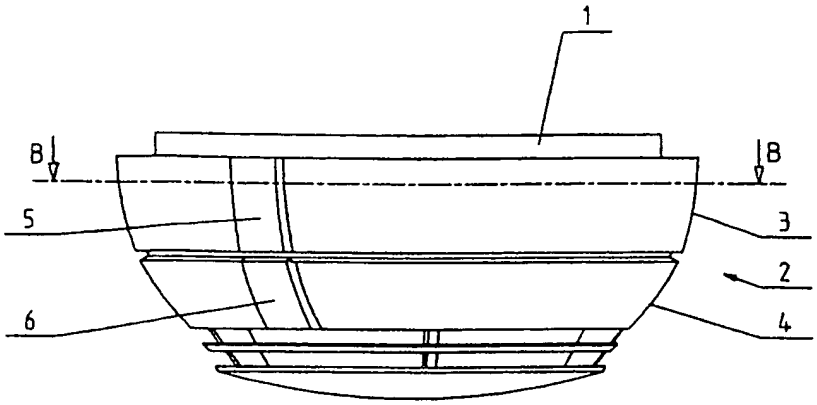


Fig. 3

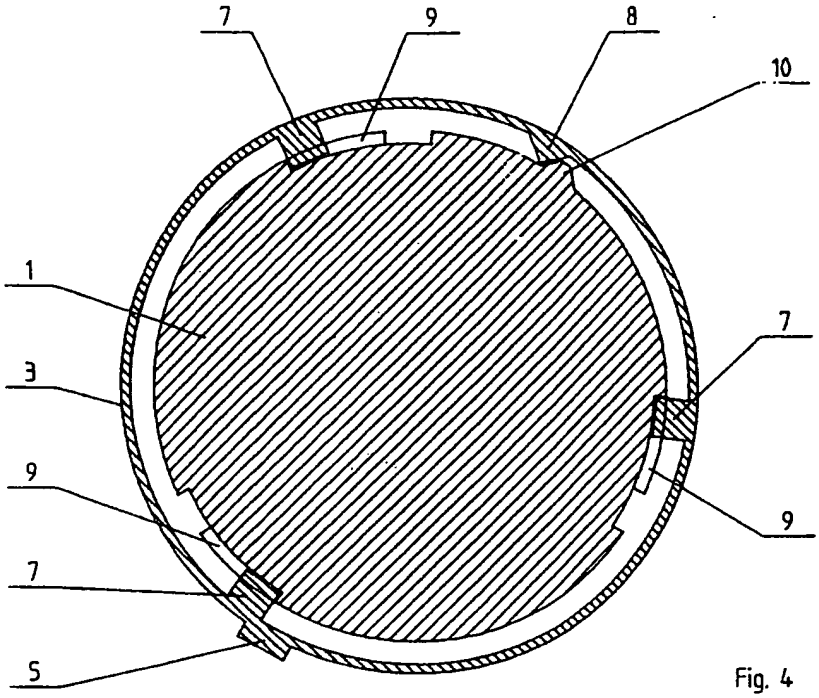


Fig. 4